

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLICATION NO. 10/026,435
ATTORNEY DOCKET NO. Q67690

AMENDMENTS TO THE DRAWINGS

The Patent Office objects to Figure 1 of the Drawings as lacking a “PRIOR ART” legend, and further objects to Figure 2 due to a misspelled word. Applicants herein amend Figures 1 and 2 to overcome the Patent Office’s objections, and attach hereto Replacement Sheets.

Attachment: Three (3) Replacement Sheets

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REMARKS

Applicants thank the Patent Office for acknowledging Applicants' claim to foreign priority, and for indicating that the certified copy of the priority document, European Patent Application No. 00403694.3, dated December 28, 2000, has been made of record in the file.

Applicants thank the Patent Office for initialing the references listed on the PTO/SB/08 A & B form submitted with the Information Disclosure Statement filed on February 12, 2002 and returning an initialed copy of the PTO/SB/08 A & B form, thereby confirming that the listed references have been considered.

Claims 1-15 have been examined on their merits.

Claims 1-15 have been editorially amended to remove reference callouts and to conform the claims to U.S. practice. Claims 1, 2, 10 and 13 have been further amended to more clearly claim the present invention. Entry and consideration of the amendments to claims 1-15 is respectfully requested.

Claims 1-15 are all the claims presently pending in the application.

1. Claims 13-15 stand rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Applicants traverse the rejection of claims 13-15 for at least the reasons discussed below.

Applicants herein amend claim 13 to clearly recite the inventive method of amplifying an input signal using a digital non-linear amplifier and an analog linear amplifier. Applicants

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respectfully submit that the § 101 rejection of claims 13-15 has been overcome, and respectfully request reconsideration and withdrawal of same.

2. Claims 4 and 13-15 stand rejected under 35 U.S.C. § 112 (2nd para.) as allegedly being indefinite. Applicants traverse the rejection of claims 4 and 13-15 for at least the reasons discussed below.

Applicants herein amend claims 4 and 13 to remove the antecedent basis errors indicated by the Patent Office. Applicants respectfully submit that the § 112 (2nd para.) rejection of claims 4 and 13-15 has been overcome, and respectfully request reconsideration and withdrawal of same.

3. Claims 1 and 2 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Stewart *et al.* (Feedforward Linearisation of 950 MHz Amplifiers). Applicants traverse the § 102(b) rejection of claims 1 and 2 for at least the reasons discussed below.

To support a conclusion that a claimed invention lacks novelty under 35 U.S.C. § 102, a single source must teach all of the elements of a claim. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986). A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The cited reference must clearly and unequivocally disclose every element and limitation of the claimed invention.

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Stewart *et al.* fail to teach or suggest a line driver for amplifying an input signal that uses a digital non-linear amplifier and an analog linear amplifier, as recited in independent claims 1 and 2. There is simply no teaching or suggestion that the MAIN amplifier of Stewart *et al.* is a digital non-linear amplifier. Furthermore, there is no teaching or suggestion in Stewart *et al.* that the input signal is converted from a digital signal to an analog signal for use by the AUX amplifier.

Based on the foregoing reasons, Applicants submit that Stewart *et al.* fail to teach or suggest all of the claimed elements as arranged in claim 1. Therefore, under *Hybritech* and *Richardson*, Applicants submit that claims 1 and 2 are allowable, and respectfully request that the Patent Office withdraw the § 102(b) rejection of claims 1 and 2.

4. Claims 1, 3, 4, 6-10 and 12-15 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Stewart *et al.* Applicants traverse the § 103(a) rejection of claims 1, 3, 4, 6-10 and 12-15 for at least the reasons discussed below.

The burden of establishing that a claimed invention is *prima facie* obvious rests on the USPTO. *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). To make its *prima facie* case of obviousness, the USPTO must satisfy three requirements:

- a) The prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the artisan to modify a reference or to combine references. *In re Fine*, 837

F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

- b) The proposed modification of the prior art must have had a reasonable expectation of success, as determined from the vantage point of the artisan at the time the invention was made. *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1208, 18 U.S.P.Q.2d 1016, 1022-23 (Fed. Cir. 1991).
- c) The prior art reference or combination of references must teach or suggest all the limitations of the claims. *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991); *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (CCPA 1970).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, the nature of a problem to be solved. *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Alternatively, the motivation may be implicit from the prior art as a whole, rather than expressly stated. *Id.* Regardless of whether the USPTO relies on an express or an implicit showing of motivation, the USPTO is obligated to provide particular findings related to its conclusion, and those findings must be clear and particular. *Id.* A broad conclusionary statement, standing alone without support, is not “evidence.” *Id.*; *see also, In re Zurko*, 258 F.3d 1379, 1386, 59 U.S.P.Q.2d 1693, 1697-98 (Fed. Cir. 2001).

In addition, a rejection cannot be predicated on the mere identification of individual components of claimed limitations. *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). Rather, particular findings must be made as to the reason the skilled

artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *Id.*

With respect to AAPA, all of the references discussed in the “State of the art” section of the instant specification describe amplifier structures (either a class O, switch mode or class K amplifier) having a digital, non-linear amplifier that is power optimized by switching between different power supply levels. However, none of the references discuss compensating for the non-linearities of those digital amplifiers. Even in the class K amplifier disclosed by Nam-Sung Jung *et al.*, the parallel linear analog amplifier is an independent source that does not compensate for non-linearities of the digital amplifier. Instead, it acts as a sensor that controls the switching between different power supply levels of the digital amplifier and therefore assists in introducing non-linearities.

The combination of AAPA and Stewart *et al.* fails to teach or suggest a line driver for amplifying an input signal that uses a digital non-linear amplifier and an analog linear amplifier and combines the outputs of the digital and analog amplifiers, as recited in independent claim 1. At the time of the conception of the present invention, one of skill in the art of designing power efficient digital amplifiers, in attempting to compensate for the non-linearities of the known power efficient digital amplifiers, would not combine Stewart *et al.* with the AAPA. Critically, Stewart *et al.* disclose, *inter alia*, the linearization of *analog* amplifiers and is not directed to the linearization of a digital amplifier. Moreover, Stewart *et al.* teach away from applying the feedforward linearization technique in applications other than microcellular radio transmissions because of the additional complexity involved. For example, the correct adjustment of the delay

elements T1 and T2, the attenuator A and the gain of the auxiliary amplifier is required in order to have appropriate phases and amplitudes of the signals entering the first cancellation element (coupler C2) and the second cancellation element (coupler C4). *See, e.g., Stewart et al.*, pg. 347, second column, first through third paragraphs. In addition, *Stewart et al.* disclose that the feedforward configuration is an open loop configuration and cannot be protected against drift. *See, e.g., Stewart et al.*, pg. 347, second column, third paragraph. Finally, the combination of AAPA and *Stewart et al.* does not use an analog linear amplifier to provide an output signal based on the difference between an analog input signal and the first output signal. For example, the input to the alleged analog amplifier of *Stewart et al.* is from a coupler. The components in the signals from delay element T1 and attenuator A cancel each other out when coupled together by coupler C2. Thus, there is no generation of an output signal based on the difference between the analog input signal and the first output signal, as recited in claim 1. Thus, Applicants submit that the Patent Office cannot fulfill the “all limitations” prong of a *prima facie* case of obviousness, as required by *In re Vaeck*.

Applicants submit that one of skill in the art would not be motivated to combine the two references. Although the Patent Office provides a motivation analysis with respect to distortion reduction, both the AAPA and *Stewart et al.* lack any teaching about the desirability of amplifying an input signal with a digital, non-linear amplifier and an analog linear amplifier that receives the un-amplified input signal and the output signal from the digital amplifier. As noted above, the AAPA uses analog amplifiers for power level switching and *Stewart et al.* is directed to the optimization of analog amplifiers, not digital amplifiers. Applicants submit that the Patent

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Office cannot fulfill the motivation prong of a *prima facie* case of obviousness, as required by *In re Dembiczak* and *In re Zurko*.

Based on the foregoing reasons, Applicants submit that the combination of AAPA and Stewart *et al.* fails to teach or suggest all of the claimed elements as arranged in claim 1. Thus, Applicants submit that claim 1 is allowable, and further submit that claims 3, 4 and 6 are allowable as well, at least by virtue of their dependency from claim 1. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 1, 3, 4 and 6.

With respect to claim 10, Applicants submit that claim 10 is allowable for at least reasons analogous to those discussed above with respect to claim 1. Thus, Applicants submit that claim 10 is allowable, and further submit that claim 12 is allowable as well, at least by virtue of its dependency from claim 10. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 10 and 12.

With respect to claim 13, Applicants submit that claim 13 is allowable for at least reasons analogous to those discussed above with respect to claim 1. Thus, Applicants submit that claim 13 is allowable, and further submit that claims 14 and 15 are allowable as well, at least by virtue of its dependency from claim 13. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 13-15.

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Claim 5 depends upon claim 1 and therefore incorporates all of its recitations by virtue of its dependency, and claim 11 depends upon claim 5 and therefore incorporates all of the recitations of claim 10 by virtue of its dependency. Briffa *et al.* does not cure the deficient teachings of the combination of AAPA and Stewart *et al.* with respect to claims 1 and 10. For example, Briffa *et al.* disclose, *inter alia*, a linearization technique that is based on predistortion, *i.e.*, modifying the input signal in a manner complementary to the non-linear amplifier distortion. This is, of course, completely different from the present invention, which does not pre-distort or modify the incoming signal prior to amplifying it. Although Briffa *et al.* disclose at col. 1, line 66 to col. 2, line 15 that application of the feedforward linearization technique has been successfully performed for radio frequency applications, Briffa *et al.* do not teach or suggest using the technique to compensate for non-linearities of digital amplifiers, such as those used to amplify DMT (Discrete Multi Tone) signals in DSL applications. Therefore, Applicants submit that claims 5 and 11 are allowable at least by virtue of their dependency from claims 1 and 10, respectively, and respectfully request that the rejection of claims 5 and 11 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

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